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| 09/912,723 | 07/23/2001 | Mark A. Lauer | LAUM-004 | 5523 |

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MARK A LAUER
6601 KOLL CENTER PARKWAY
SUITE 245
PLEASANTON, CA 94566

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| EXAMINER |
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KLIMOWICZ, WILLIAM JOSEPH

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| ART UNIT | PAPER NUMBER |
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2652

DATE MAILED: 01/11/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/912,723

Applicant(s)

LAUER, MARK A.

Examiner

William J. Klimowicz

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 08 March 2004.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-4,6-14 and 17-20 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-4,6-14 and 17-20 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

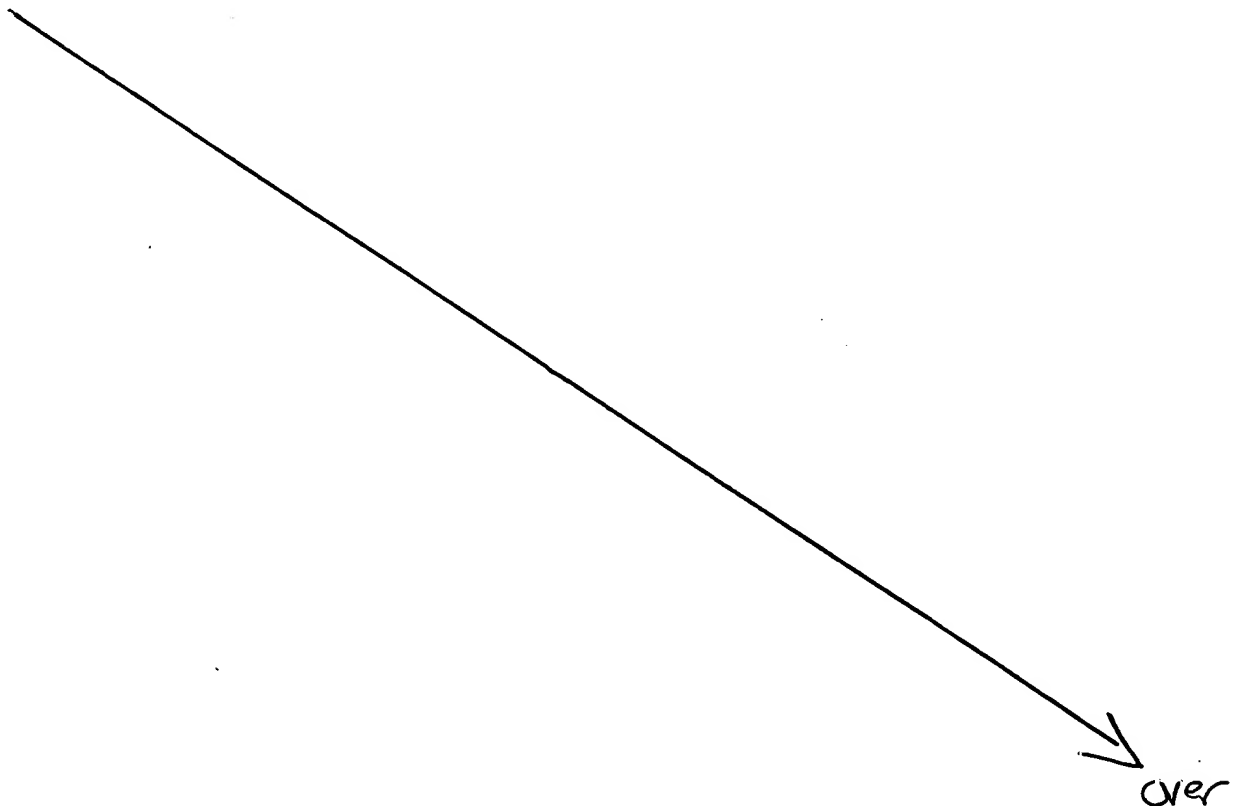
Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION***Non-Final Office Action on the Merits***

As noted in a previous communication to the Applicant, the Examiner notes that an Appeal Brief was filed on March 8, 2004 (Paper No. 12). Among the issues discussed in the arguments of the Appeal Brief, the Applicant has argued the term of independent claim 1, that term being "adjoining." It is argued that the term "adjoining," as interpreted by the Examiner, is inconsistent with its usage as set forth in the Applicant's disclosure.

More concretely, the Examiner had previously maintained that Soeno et al. (US 6,246,552 B1) disclosed an electromagnetic transducer (1) and a substrate (e.g., 43) "adjoining" the transducer (1). It was the Examiner's position that as best depicted in the embodiments of, by example only, Figures 2-5, the substrate (43) was considered as "adjoining" the transducer (1), i.e., the transducer (1) being "next to" the substrate (43).



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The Examiner based this interpretation on a definition of the word “adjoin” as found in *Webster’s II Riverside New College Dictionary*, which defines “adjoin” as:

1. To be next to. 2. To attach by joining -vi. To be in or nearly in contact.

The Examiner then reasoned that the instant specification is completely silent with respect to the definition of the word “adjoining.” In the opinion of the Examiner, the dictionary definition indicated that the use of the word “adjoining” merely required that two elements or objects be next to each other, and possibly contacting one another, but were expressly not required to be in contact.

The Examiner therefore at the time, considered the scope of the claims, with respect to the recitations “a substrate (e.g., 43) adjoining said transducer (1)” to include the structures (43) and (1), as being shown in, e.g., the Figures 2-5 of Soeno et al. (US 6,246,552 B1).

Subsequent to the Applicant filing the Appeal Brief, however, a decision was handed down in a Federal Circuit Appeal (CAFC), International Rectifier Corp. v. IXYS Corp. 02-1414,-154 on March 18, 2004. In this very recent CAFC decision, a factually similar situation was raised as it pertained to the term “adjoining.” See, e.g., page 16 through page 18 of the full text decision, appended to the previous Communication mailed April 21, 2004.

Based upon the reasoning forwarded by the CAFC, the Examiner has now determined that the Soeno et al. (US 6,246,552 B1) may not anticipate the invention as currently drafted. The CAFC effectively stated that the term “adjoining” was to be interpreted as “contacting.”

The Examiner, however, noted that although the term as previously interpreted by the Examiner, had been cast in a much different light in view of the very recent decision by the CAFC, the Examiner felt that there still existed art that may indeed have read on some of the

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pending claims. In order to expedite prosecution on the merits, the Examiner invited the Applicant to contact the Examiner to discuss language that would be favorably considered over *all* the art of record. After numerous attempts at reaching a consensus, however, no formal agreement was secured.

As such, the Examiner has reopened prosecution in this application based on the interpretation given to the meaning of "adjoining" as being in direct "contact."

Claim Status

Claims 1-4, 6-14 and 17-20 are currently pending.

Claims 5, 15 and 16 have been voluntarily cancelled by the Applicant.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1, 7-10 and 20 are rejected under 35 U.S.C. 102(b) as being anticipated by Harada et al. (JP 9-035230 A).

As per claims 1 and 20, Harada et al. (JP 9-035230 A) discloses a device for reading or writing information (see FIG. 1 - disk drive), the device comprising: an electromagnetic transducer (magnetic head 1, which includes electromagnetic transducing element - solid layers of an electromagnetic induction element 11 and magnetoresistive element 12 - see paragraph

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[0029] of enclosed English machine translation) including a plurality of solid transducer layers (e.g., the layers of the induction head (11) and/or the layers of the magnetoresistive head (12)), a substrate (e.g., slider (2) and unitary integral flexures (3, 3)) adjoining said transducer (1), said substrate (2, 3) shaped as a rigid body (slider portion which directly adjoins the transducer (1)) adjacent to said transducer (1) and as a plurality of flexible elements (3) distal to said transducer (1) (e.g., see FIGS. 3, 4 and 5), and an actuator - actuation means as per claim 20 (e.g., portion of load arm between elements (7) which magnetically interacts with (7) to rotationally position the slider (2) to a selected track of the disc (6)) attached (i.e., fastened or secured or joined to) to said substrate (2 including flexing elements (3)) distal to said transducer (1) (via (4) and/or (5)). Note the Examiner has interpreted the term "attached" as encompassing non-direct contact. For example, two objects can be considered as being "attached" (or for that matter "joined" or "secured" or "fastened") to each other by an intervening element, such as resin or glue bonding the two objects together, without requiring direct contact between the two objects.

As per claim 7, wherein said rigid body (2) has a media-facing-surface (e.g., see FIG. 2) separated from a back surface (e.g., upper surface of (2) on which (4) resides - see FIG. 3) in a Z-direction, and at least a portion of said flexible elements (3) is disposed at a Z-height between said surfaces (e.g., see FIG. 3 wherein the lowermost surface of (3) is indeed between the media facing surface of (2) and its uppermost surface).

As per claim 8, wherein said flexible elements (3) are aligned *substantially* with a plane, and said rigid body (2) and said actuator are intersected by said plane (see FIG. 2).

As per claim 9, wherein said rigid body (2) has a media-facing-surface (surface of (2) closest to disk (6)) separated from a back surface (back surface of (2) which is contacted by (4)),

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and said back surface has a protrusion extending away from said media-facing surface (e.g., portion of (21) which rises through and above (2) to form portion (4), which is in a plane above [thus a protrusion] above the back surface of (2) as seen in FIG. 3).

As per claim 10, wherein at least one of said flexible elements (3) contains a plurality of conductive leads (4) - see FIG. 4.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 2-4, 11-14, 17 and 19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Harada et al. (JP 9-035230 A) in view of IBM Technical Disclosure Bulletin entitled "Piezoelectric Actuator for Small Hard Disk Drive," Vol. No. 36, Iss. No. 2, pp. 379-380, published February 1, 1993.

See the discussion of Harada et al. (JP 9-035230 A), *supra*.

As per claim 14, see the discussion of claim 8, *supra*.

As per claim 17, see the discussion of claim 9, *supra*.

With regard to claims 2-4, 11 and 12, Harada et al. (JP 9-035230 A) remains silent with respect to the aforementioned actuator including a layer or layers of piezoelectric material (i.e., an electrostrictive actuator as per claim 11).

Such piezoelectric layers (as well as actuators used in the type of disk drive disclosed by Harada et al. (JP 9-035230 A)) are well known in the art, however.

As just one example, IBM Technical Disclosure Bulletin entitled "Piezoelectric Actuator for Small Hard Disk Drive," Vol. No. 36, Iss. No. 2, pp. 379-380, published February 1, 1993 (referred to hereinafter as IBM TDB), discloses a rotary type actuator used in an analogous type of disk drive as that of Harada et al. (JP 9-035230 A), wherein the corresponding actuator used within the IBM TDB includes a piezoelectric layer/layers (i.e., an electrostrictive actuator) formed as part of a piezoelectric actuator, in lieu of the conventional type rotary actuator. The IBM TDB uses such a piezoelectric actuator in lieu of the conventional actuator in order to, *inter alia*, reduce access time, provide high shock resistance and reduce volume. See the last paragraph of page 1 of the IBM TDB.

Additionally, as per claim 19, wherein the actuator of the IBM TDB includes means ("certain voltage applied to the piezo(s)"- see description of the IBM TDB), for providing electrical voltage to said piezoelectric (i.e., electrostrictive) actuator.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to provide the piezoelectric actuator of the type disclosed by the IBM TDB, in lieu of the conventional actuator disclosed by Harada et al. (JP 9-035230 A).

The rationale is as follows: one of ordinary skill in the art would have been motivated to provide the piezoelectric actuator of the type disclosed by the IBM TDB, in lieu of the conventional actuator disclosed by Harada et al. (JP 9-035230 A) in order to, *inter alia*, reduce access time, provide high shock resistance and reduce volume. See the last paragraph of page 1 of the IBM TDB.

Moreover still, as per claim 3 and 13, the resulting combination of the piezoelectric actuator as taught and explicitly suggested by the IBM TDB, as applied to Harada et al. (JP 9-035230 A), would provide horizontally disposed piezoelectric layers as depicted in the FIGS. of the IBM TDB which would be "substantially parallel" with the horizontal layers of the transducer (e.g., the upper and lower core layers (112) which constitute part of the induction head - see FIG. 3 of Harada et al. (JP 9-035230 A)).

Claim 6 is rejected under 35 U.S.C. 103(a) as being unpatentable over Harada et al. (JP 9-035230 A) in view of Endo (JP 06-176517 A).

See the discussion of Harada et al. (JP 9-035230 A), *supra*.

With regard to claim 6, Harada et al. (JP 9-035230 A) does not explicitly show wherein the flexures of the suspension are substantially aligned with a center of mass of said rigid body (i.e., the slider).

Endo (JP 06-176517 A), however, disclose wherein a support suspension portion of the flexure end of a suspension is absorbed into the slider (i.e., rigid body) thickness and thus adjacent to the center of mass of the slider (i.e., rigid body), in order to, *inter alia*, shorten the distance against the surface of the magnetic disk (i.e., by reducing the Z-height) and to further provide stable support of the slider by positioning such flexure(s) adjacent the center of mass of the rigid body.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to provide the teaching of a suspension end flexure support provided as being

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substantially aligned with a center of mass of the rigid body of Harada et al. (JP 9-035230 A), as explicitly taught and suggested by Endo (JP 06-176517 A)..

The rationale is as follows: one of ordinary skill in the art would have been motivated to provide the teaching of a suspension end flexure support provided as being substantially aligned with a center of mass of the rigid body of Harada et al. (JP 9-035230 A), as explicitly taught and suggested by Endo (JP 06-176517 A) in order to, shorten the distance against the surface of the magnetic disk (i.e., by reducing the Z-height) and to further provide stable support of the slider by positioning such flexure(s) adjacent the center of mass of the rigid body.

Claim 18 is rejected under 35 U.S.C. 103(a) as being unpatentable over Harada et al. (JP 9-035230 A) and IBM Technical Disclosure Bulletin entitled "Piezoelectric Actuator for Small Hard Disk Drive," Vol. No. 36, Iss. No. 2, pp. 379-380, published February 1, 1993, as applied to claim 11 above, and further in view of Fukuoka (JP 09-148639 A).

See the descriptions of Harada et al. (JP 9-035230 A) and the IBM TDB, *supra*.

As per claim 18, the IBM TDB, as applied to Harada et al. (JP 9-035230 A), remains silent with respect to the composition of the piezoelectric actuator as containing a material including silicon. Note that the slider of Harada et al. (JP 9-035230 A) is indeed formed of silicon as per claim 18.

It is well known, however, that piezoelectric actuators of the type disclosed by the IBM TDB wherein the actuator includes a silicon composition are well known.

As just one specific example, Fukuoka (JP 09-148639 A) discloses a piezoelectric actuator wherein portions thereof include compounds of silicon so as to "prevent deformation of an inner electrode" of a piezoelectric actuator.

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It would have been obvious to one of ordinary skill in the art at the time the invention was made to provide the piezoelectric actuator of the IBM TDB as applied to Harada et al. (JP 9-035230 A), as including a compound of silicon as is known, as exemplified and suggested by Fukuoka (JP 09-148639 A).

The rationale is as follows: one of ordinary skill in the art would have been motivated to provide piezoelectric actuator of the IBM TDB as applied to Harada et al. (JP 9-035230 A), as including a compound of silicon as is known, as exemplified and suggested by Fukuoka (JP 09-148639 A) in order to, *inter alia*, prevent deformation of an electrode of a conventional piezoelectric actuator as explicitly suggested in the manner disclosed by Fukuoka (JP 09-148639 A).

Conclusion

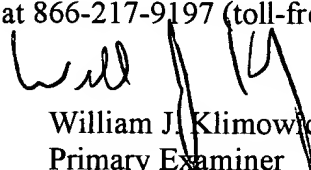
The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to William J. Klimowicz whose telephone number is (703) 305-3452. The examiner can normally be reached on Monday-Thursday (6:30AM-5:00PM).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Hoa T. Nguyen can be reached on (703) 305-9687. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



William J. Klimowicz
Primary Examiner
Art Unit 2652

WJK